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Poverty 423

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### **The Effects of Just Land Distribution on Public Health in Latin America**

If you walk into the headquarters for Acción Médica Cristiana, a Nicaraguan public health NGO, you would expect to see charts on dental hygiene seminars and disease control after natural disasters. You may, however, be surprised to also hear board meetings on land bank financing in rural provinces or see videos on sustainable agriculture. What is a public health NGO doing talking about land reform? This paper argues that land ownership and sustainable agricultural techniques are vital components of any holistic public health scheme in Latin America. As such, getting land into the hands of Latin America's rural poor should become a primary goal for public health organizations seeking to reduce fertility rates, stifle rural outmigration and urban crowding, improve nutrition, target women's health and empowerment, and reduce poverty.

In this paper, I will illustrate how urban and rural land reforms each affect public health. The term "land reform" can take on a multitude of meanings, but for the purposes of this paper I have defined it as the redistribution of land by the State for the purpose of conferring legal property rights to indigent citizens. I will begin Part I with a brief discussion on the history of land reform in Latin America, follow with the theoretical framework for how contemporary land reform affects public health in Part II, and discuss in Part III three case studies of contemporary land reform models and their public health responses. In some cases where academic literature is sparse, the connections are loose and highlight the need for more research in these areas. In

areas where the majority of the current academic literature on the effects of land titling focus on urban settings, this contribution demonstrates (1) which of and how these principles are applicable to the rural setting, and (2) how shifting these land redistribution programs to the countryside will alleviate health losses caused by overcrowding in urban centers. Because the relationships between land reform and public health are generally indirect, the framework of this paper draws the lines to show how various models of land reform (rural vs. urban, national vs. grassroots) influence determinants of public health (i.e. economic resources, food scarcity, migration patterns), which in turn elicit public health responses. The public health determinants I examine are: (1) economic resources, (2) housing and infrastructure, (3) food scarcity and nutrition, (4) female empowerment, and (5) migration patterns.

### **Part I: A Brief History of Land Ownership in Latin America**

Land and landlessness has been a major cause of war, uprising, and political turmoil through history, spanning time and culture. As the dominant source of food, income, political stature and displays of wealth for millennia, land ownership has evolved into much more than its pragmatic role of sustenance. Throughout Latin America, a country's dependence on agriculture as a contributor to GDP is almost directly proportional to its state of development. Wealthy countries like Mexico, Chile, Brazil, and Peru derive between 12% and 17% of their GDP from agriculture, while the poorest countries of Nicaragua, El Salvador, Honduras, Guatemala, and Haiti depend on agriculture for up to 40% of their GDP.<sup>1</sup>

Prior to the beginnings of European colonization at the turn of the 16<sup>th</sup> century, most native American conceptions of property centered on ideals of communal ownership and

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<sup>1</sup> Morales, César. "National Agricultural Research Systems in Latin America and the Caribbean: Changes and Challenges." *United Nations: Division of Production, Productivity, and Management*. (United Nations: Santiago, 1998), 10.

reciprocity. For example, the Miskitu of present-day Honduras, Nicaragua, and Panama enacted their cultural values of kinship-based redistribution and reciprocity through their economic activities.<sup>2</sup> Simply put, within Miskitu society, no possession – including and especially land – has value beyond its ability to contribute to the community as a whole. Colonization decimated indigenous ideas of property ownership along with the health of the Native Americas.

Veltmeyer states that the seizing of indigenous lands by European colonists forced a “rather abrupt destruction and transformation of pre-capitalist and per-colonial indigenous societies into proto-capitalist class-divided and dominated forms of transplanted European societies.”<sup>3</sup>

Centuries of ‘conquest’ and expropriation of native lands ensued set against a backdrop of peasant rebellion and violent backlash from the ruling classes. This semi-feudal *hacienda* economic structure and consequent peasant uprisings continued to varying degrees until the populist movements of the early 20<sup>th</sup> century put land redistribution back on Latin America’s national political agenda.

The state of indigenous health deteriorated along with the native conception of land ownership. Working as servants, tenant farmers, and slaves placed indigenous workers in direct contact with a wide variety of diseases to which the native population had no immunity, most notably smallpox, measles, yellow fever, chicken pox, influenza, whooping cough, and typhus. European colonists imported their own livestock, rather than adopting the Americas’ natural breeds. The introduction of new species brought the diseases and vectors those species carried to the native domesticated livestock and the native populations who worked with them. The

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<sup>2</sup> Susan Hawley. “Protestantism and Indigenous Mobilisation: The Moravian Church among the Miskitu Indians of Nicaragua.” (*Journal of Latin American Studies*, vol 29:1, Feb 1997), 117.

<sup>3</sup> Veltmeyer, Henry. “The Dynamics of Land Occupations in Latin America.” *Reclaiming the Land: The Resurgence of Rural Movements in Africa, Asia and Latin America*. Ed. Sam Moyo and Paris Yeros. (Zed Books: New York, 2005), 287.

combined effect of these virulent diseases with deprivation, oppression, inequality, and relative poverty decimated the indigenous population to a fraction of its pre-colonial state.<sup>4</sup>

Contemporary conceptions of Latin American land distribution, like all of the region's politics, must be viewed through the lens of the populist and Communist movements that swept the region through the early to mid twentieth century and the crushing conservative backlash that followed. Throughout the last century, land and landlessness has been a political tool for both the Left and the Right. During the height of the Left in Latin America, a series of land reforms took place as part of the populist movements, but were quickly reversed once conservative regimes took power. Later, Mexico's and Brazil's conservative leaders Lázaro Cardenas (1940s) and Luíz Lula de Silva (present-day), respectively, implemented the land distribution policies in place today. Paralleling the political back-and-forth, redistributive land policies have generally been supported by the U.S. only when reform supported the U.S.'s political and economic interests.<sup>5</sup>

While the actual shape of agrarian reform varied widely among Latin American countries, there are a few fairly universal characteristics. With the exception of Costa Rica, all countries expropriated inefficiently used or overly concentrated land from wealthy private owners, and with exception of Nicaragua, which forcibly expropriated lands the Somoza family

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<sup>4</sup> Ramenofsky, Ann, Alicia Wilbur, and Anne Stone. "Native America disease history: past, present, and future directions." (*World Archeology*, Vol 35:2, 2003), 242-245.

<sup>5</sup> In 1961, President John Kennedy launched a new partnership with Latin American known as the Alliance for Progress. Although this agreement claimed to support "comprehensive land reform, leading to the effective transformation, where required, of unjust structures and systems of land tenure and use" (Deere and León, 63), U.S. support stopped at words. Taking place in the wake of the Cuban Revolution and at the height of the Cold War, the U.S.'s interest in agrarian reform rested predominantly on its desire to secure democracy and capitalism in Latin America. Peter Dorner notes that "a major dilemma has been that any Latin American government radical enough to carry through a redistributionary land reform inevitably came into conflict with the ideological stance of the U.S. government" (quoted in Deere and León, pg. 65). As such, the U.S. aided in the overthrow of Guatemala's freely elected Arbenz government in 1952, whose agrarian reform threatened the interests of the United Fruit Company, while later supporting the Right-leaning Bolivian land reforms in 1952. Cuba's land reform placed sugar plantations under state control and increased competition for the U.S. sugar industry, and was thus opposed. As the Cold War entered the 1960s, however, the profound economic and social benefits of agrarian reform became more pronounced and have since generally be met with international approval.

had acquired through illicit means, all private owners were compensated for their seized lands in some form. Most reforms adhered to a “land to the tiller” ideology which sought to grant tenant farmers with property rights for the land they worked.<sup>6</sup> Urban land titling is a relatively new political movement, and prior to the early 1990s almost all political talk of land redistribution referred to agrarian reform.

Because of the region’s colonial history of indigenous oppression, land reforms throughout Latin America have been frequently intertwined with indigenous rights movements, calling into question the relationship between international economic interests, national public health efforts, and traditional conceptions of property and communal ownership. Reforms in Mexico and Bolivia, for example, honored indigenous land claims by returning indigenous lands that had been forcibly seized by wealthy hacienda owners without compensating those who ‘stole’ the land. Despite this overture, the indigenous-led Mexican Zapatista uprising is currently fighting for equal rights for Mexico’s southern indigenous populations that have been disadvantaged by NAFTA and other agricultural and land ownership policies.<sup>7</sup> In spite of these centuries of struggle, as of 1998 ninety percent of Latin America’s arable land was still held by only twenty-six percent of its population.<sup>8</sup>

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<sup>6</sup> Deere, Carmen and Magdalena León. *Empowering Women: Land and Property Rights in Latin America*. (University of Pittsburgh: Pittsburgh, 2001), 65-68.

<sup>7</sup> The Zapatista’s are fighting for the land and agricultural rights of the indigenous peoples around the province of Chiapas in southern Mexico. They argue that the impoverished native populations have been excluded from national education and land distribution programs. In recent times, they have opposed the conditions of NAFTA, which make international competition with North American heavily subsidized agricultural industries nearly impossible for small farmers (See Alma Guillermoprieto’s *Looking for History: Dispatches from Latin America*, p 185-223).

<sup>8</sup> Deere and León, 65.

## **Part II: Theoretical Framework of How Land Reform affects**

### **Determinants of Public Health**

Amartya Sen argues that various development indicators can act as both an end and a means of poverty reduction.<sup>9</sup> The status of public health, with its own intrinsic value coupled with its ability to enhance productivity and income, is clearly one of these indicators. This means that improvements to nutrition, fertility rates, and sanitation lead to higher incomes, which in turn increase disposable income for the medical expenditures and education that contribute to better health – better health leading to higher incomes leading to better health, and so on. This section explicates the relationships illustrated in Table II (above).

#### **Economic Resources**

Peruvian economist and entrepreneur, Hernando de Soto, is largely responsible for the recent push for land titling program in South America. He has argued that formally recognizing currently informal property rights harnesses the vibrant economic force hidden in Latin America's thriving informal economy.<sup>10</sup> Land reform has an inherently redistributive quality, both in terms of physical capital and politico-economic power, and land reform is universally acknowledged to increase incomes in both urban and rural settings through three dominant avenues. First land titling reduces the risk of expropriation. Removing the fear of losing your home and belongings encourages investment in home and community infrastructure, the health benefits of which will be discussed in the next section. More importantly in urban households, formal property titles eliminate a family's need to keep a 'guard' at home to protect informal property rights from the authorities or other squatters, thus freeing productive family members to

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<sup>9</sup> Sen, Amartya. *Development as Freedom*. (Anchor: New York, 1999).

<sup>10</sup> See de Soto's *The Other Path: The Invisible Revolution in the Third World*.

seek education or waged work outside the home. Second, with a formal property title, homeowners can see financial gains from the sale or trade of their property. And finally, property titles serve as collateral and thus grant their owners access to formal credit markets.<sup>11</sup> With credit, families without savings can secure funding for a multitude of expenditures, thereby either directly financing medical care or freeing household resources to be diverted towards expenditures with positive health outcomes. Indeed the primary driving force behind the recent urban land titling programs has been that in giving poor families formal deeds, governments grant potential entrepreneurs access to the funds needed for investment in business and thus simultaneously stimulate local economies and reduce poverty and the poor health that accompanies it.<sup>12</sup>

These effects are also seen in the rural settings without much variation. In rural settings where commercial and subsistence agriculture is the dominant form of survival, land ownership rescues waged agricultural workers from wretched wages and dangerous conditions on large commercial plantations and saves tenant farmers from diverting large portions of their income to rents for wealthy landowners. Because most rural farmers rent their land legally, their fear of expropriation stems not from theft or being kicked off their land, but from being unable to keep up with crushing debts accrued from exorbitant rents and high interest rates. These inescapable debts have been linked to high suicide rates in rural areas.<sup>13</sup> A poignant statistic tells that the second highest cause of death in Nicaragua is suicide.<sup>14</sup> Furthermore, rural farmers use land not only as a place to build your home; it is your primary means of making a living. Because of this,

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<sup>11</sup> Field, Erica. "Entitled to Work: Urban Property Rights and Labor Supply in Peru." (*Quarterly Journal of Economics: MIT Press*, 2003).

<sup>12</sup> Vogl, 2004.

<sup>13</sup> Bagchi, Suvojit. "Punjab Suicides Cast Shadow on Polls." BBC World News. 12 April 2009. [http://news.bbc.co.uk/2/hi/south\\_asia/7992327.stm](http://news.bbc.co.uk/2/hi/south_asia/7992327.stm).

<sup>14</sup> "Country Profiles: Nicaragua," 2-4.

land redistribution increases incomes and provides resources for small farmers to invest in their own plots, medical expenditures, or housing infrastructure. In economic terms, it reduces the opportunity cost of behaviors that promote good health. Although access to any form of credit market in rural areas has historically been sparse, there is some evidence that growth in microfinancing programs are slowly granting rural communities access to the financial and medical benefits of the credit market.<sup>15</sup>

### Housing and Infrastructure

One common area with strong public health benefits to which poor households are likely to divert resources is housing investment. In recent years, Latin America's cities have shown higher home ownership rates compared to other lesser developed regions, making the large-scale exploitative landlord is generally a character of the past. Most contemporary landlords own a few small properties and often live on the properties they rent.<sup>16</sup> While higher home ownership rates benefit those with property titles, this increase deepens the relative poverty experienced by those living in Latin America's slums without access to formal ownership.

Excluded from the formal housing sector, Peru's urban poor fed into a housing market known as "progressive housing." The informal, "progressive" housing market begins with land occupation through invasion or purchasing land of undetermined ownership, zoning, or below standard conditions. After a small group or family has built a shack or set up a tent, the transition phase begins as other families establish rudimentary homes and demand basic services from local authorities. The consolidation phase begins once the settlement has achieved most infrastructure systems and official acknowledgement. Progressive housing is popular most

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<sup>15</sup> Torero and Field,

<sup>16</sup> Fay, Marianne and Anna Wellenstein. "Keeping a Roof over One's Head: Improving Access to Safe and Decent Shelter." *The Urban Poor in Latin America*. Ed. Marianne Fay. (The World Bank: Washington DC, 2005), 93.



because it is substantially cheaper than the formal market. Fay and Wellenstein cite that in Buenos Aires, the cost for cheapest formal housing markets average 2.7 times the median income, while progressive housing costs average only 0.8 times the median. Furthermore, the formal market requires capital in hand up front in the form of down payments, mortgages, and taxes. Progressive housing, by contrast allows homes to be built and developed over time, making a sort of pay-as-you-go system.<sup>17</sup> The down side is that unless a family has lived in a progressive market for many years or even generations, they must survive in substandard housing, exposed to the elements, urban pollution, and poor sanitation – all of which have detrimental effects on health.

This is where property titling comes in. Just as wealthy renters are typically less likely to invest in their homes than homeowners, renters and squatters are less likely to waste resources on tenuously held informal property rights. Likewise, property ownership is correlated with community organization and infrastructure development, meaning that titled communities are more likely to have sanitation services, garbage disposal, and access to clean water than informal neighborhoods. Inadequately disposed garbage is associated with increase morbidity and mortality from diarrhea,<sup>18</sup> but garbage burning results in high concentrations of heavy metals, chemicals, pollutants in the air and soil.<sup>19</sup> Urban poor living in and around city dumps, such as the 1,500 people living in Managua, Nicaragua's city dump, "La Chureca," receive a double dose of these harmful airborne toxins; not only do they burn their own garbage but they must endure the constantly burning garbage from combustions in the dump's mountain of trash. Investments in home heating, cooking, and ventilation systems have been shown to reduce carbon dioxide

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<sup>17</sup> Fay and Wellenstein, 95-96.

<sup>18</sup> See Campos, *et al*, 1995.

<sup>19</sup> See Cuadras, 2005.

levels, burn injuries, and respiratory diseases from airborne combustion particles.<sup>20</sup>

Additionally, the benefits for morbidity and mortality statistics from investing in clean water sources have been well documented.<sup>21</sup>

One possible deleterious effect of newly recognized property rights on health is the possibility that land titling may encourage households to place a stronger emphasis on investments in physical capital in the form of home investment and other consumer goods, rather than human capital through health and education. Galiani and Schargrotsky show tentative evidence that in the short-term, some Buenos Aires families living on newly titled plots choose to increase expenditures on home improvements in lieu of investments in child health.<sup>22</sup>

### Food Scarcity and Nutrition

The Pan American Health Organization (PAHO), the World Health Organization's Latin American regional organization, names undernutrition as "one of the leading ways that poverty and inequality get passed from generation to generation."<sup>23</sup> This is because of its severe consequences for physical and emotional development, especially during childhood years. Deficiencies in iron, zinc, iodine, and vitamin A in children contribute to multiple cognitive and physical disadvantages and lead to impaired productivity in adult years. Undernourished individuals, especially children, are more susceptible to illness and have increased mortality rates, and childhood illnesses are responsible for delayed school enrollment and high absence rates, perpetuating the cycle of poverty that keeps generations vulnerable to hunger, disease, and

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<sup>20</sup> See Smith, 2002; EPA 1997; Kannan *et al* 2006, respectively.

<sup>21</sup> See Merrick, 1985; Behrman and Wolfe, 1987; the Cebu Team, 1991; Lavy et al., 1996; Lee et al., 1997; Jalan and Ravallion, 2003.

<sup>22</sup> Galiani, Sebastián and Ernesto Schargrotsky. "Effects of Land Titling on Child Health." (Inter-American Development Bank: Washington DC, 2004), 7.

<sup>23</sup> *Health in the Americas*. Volume I: Regional. Pan American Health Organization. (Pan American Health Organization: Washington DC, 2007), 41.

poor health.<sup>24</sup> Latin America as a whole has improved its hunger statistics and is well on track towards meeting its Millennium Development Goal of cutting hunger in half by 2015. These averages, however, mask a vastly unequal distribution of the effects throughout the region.<sup>25</sup>

Land titling affects urban and rural nutrition through very different processes, and studies yield varied results on the desirability of the health response. Urban land titling programs in particular have demonstrated mixed effects on childhood nutrition. Studies tend to indicate that urban land titling correlate anthropometrical improvements in child weight-for-height measures (wasting), but no effect on height-for-weight data (stunting). Studies repeatedly find, however, that the improvements in child weight are accompanied by increased incidence of childhood obesity. Obesity, especially in children, elevates the risk of type-2 diabetes and cardiovascular diseases. In Buenos Aires increases in body weight coincided with a title-related increase of 23.7 percent in childhood risk of obesity, leading researchers to question whether or not the higher child weights necessarily indicated improved nutrition. This is attributed to the fact that urban populations have lower rates of undernourishment to begin with and generally live more sedentary lifestyles.<sup>26</sup> These findings are consistent with the circumstances, however, given how recently the titling programs were implemented. Wasting can reflect either short-term or long-term undernutrition and is more sensitive to exogenous shocks, such as changes in policies and

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<sup>24</sup> *Health in the Americas*, 42.

<sup>25</sup> South America and the Caribbean have seen disproportionately high reductions in malnutrition. Meanwhile, undernourishment throughout most of Central America has remained stagnant or worsened, as in Panama, Guatemala, and Venezuela. Skewed distribution is also evident in underweight children (age 5) statistics, which range from 0.7% in Chile to 22.7% in Guatemala. It is notable that countries with the more dramatic reductions in undernourishment (i.e. Peru, Argentina, and Brazil) have also implemented some of the most effective land reform policies in Latin American during the same time period. It is doubtful, however, that the reductions can be entirely attributed to these reform, and more likely that both statistics are reflective of a strong national commitment to reducing poverty as a whole and reaching Millennium Development Goals (*Health in the Americas*, 41-43).

<sup>26</sup> Galiani and Scargrotsky, 2004.

reforms.<sup>27</sup> By contrast, stunting is a measure of stature and is indicative of long-term under- or malnutrition. The combination of wasting and stunting can tell a person or community's nutritional life story.<sup>28</sup>

Rural land reform has almost seen mixed effects on nutrition, but for very different reasons than its urban counterpart. Theoretically, access to agricultural land should also increase access to sufficient food supplies. However, in rural areas where agriculture is both the primary means of sustenance and income, commercial interests have sometimes been shown to trump household nutritional needs. Particularly during years of drought or plagues, farmers must choose between giving the youngest children the nutrients they need or garnering the income needed to invest for next year's harvest. However, evidence is just as abundant to suggest that rural land redistribution does improve child nutrition through direct access to sustainable, nutritious food supplies. These mixed results highlight the interdependency of factors contributing to poverty and poor health. There is little academic literature on these factors in Latin America, but Fleuret and Fleuret found that in Kenyan villages where land was redistributed, child nutrition depended on the type of crop cultivated, has a positive relationship with the extent of other social services provided, and a negative relationship with international prices for the dominant cash crop, although the relationships were weak and generally erratic.<sup>29</sup>

In addition to the nutritional benefits of owning agricultural plots, programming to teach medicinal gardening has been shown to complement, or often supplement, formal medical care in rural areas where the nearest clinic or pharmacy may be several days walk away. Programs

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<sup>27</sup> The term "undernutrition" describes an insufficiency in total calories consumed. "Malnutrition" refers to an insufficiency of specific nutrients needed for physical and mental development.

<sup>28</sup> For example, a woman of short stature and healthy weight may have endured poor nutrition during her developmental years but now enjoys a satisfactory nutrition. During an isolated famine, a man may stand at an average height, but have low body weight due to undernutrition. A combination of wasting and stunting, however, reveals a life of prolonged starvation.

<sup>29</sup> Fleuret and Fleuret, "Social Organization, Resource Management, and Child Nutrition in the Taita Hills, Kenya." (*American Anthropologist*. Vol. 93:1, 1991), 98-111.

from NGOs to teach farmers to set aside small plots of land for medicinal gardens. Working within the framework of traditional medicinal practices, small gardens of medicinal plants can suffice in cases of minor to moderate health issues.<sup>30</sup> A list of Brazilian medicinal crops and their medical advantages is found in Table I.<sup>31</sup>

Another way to affect nutrition, particularly in rural areas, is by changing the type of agriculture done, both through introducing sustainable farming techniques and crop diversification to include fresh fruits and vegetables. Utilizing sustainable agricultural techniques not only secures the longevity and productivity of the land, but it also addresses a major public health concern in Latin America – persistent poisoning from the consumption of agricultural chemicals. In Nicaragua, the lack of regulation on pesticide use results in Nicaraguans consuming dangerous levels of harmful chemicals. Emphasizing the use of natural fertilizing processes, such as a technique known as vermiculture that uses large numbers of earthworms to replace soil nutrients, and environmentally safe pesticides, protects long-term investments in the land and agricultural process while simultaneously addressing the short-term issue of poor health due to poisoning.<sup>32</sup> Furthermore, the practice known as agroforestry – planting tree-growing crops among ground vegetables – simultaneously encourages a more nutritious variety of crops and reduces the need for fertilizers by preventing soil erosion and providing natural nutrients to surrounding soils. Studies have shown that reforms with programs to encourage agroforestry do show a significantly increased incidence of sustainable agricultural techniques.<sup>33</sup>

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<sup>30</sup> Acción Médica Cristiana, [http://www.amc.org.ni/amc/territorios\\_AguasAmarillas.html](http://www.amc.org.ni/amc/territorios_AguasAmarillas.html).

<sup>31</sup> Taken from Ferreira de Lima, Maria, Eulália Ximenes, Josiane Luna, Antônio Sant'Ana. "The antibiotic activity of some Brazilian plants." (*Revista Brasileira de Farmacognosia*, Vol 16:3, 2006).

<sup>32</sup> WHO 5-6.

<sup>33</sup> Casey, James. "Agroforestry adoption in Mexico: using Keynes to better understand farmer decision-making." (*Journal of Post Keynesian Economics*. Vol 26:3, 2004).

**Table 1.** Plant materials submitted to the antimicrobial activity assay based on their ethnobotanical uses

FAMILY / Species and voucher reference	City-state of collection and date of harvest	Plant part assayed	Ethnobotanical use	Reference
ANACARDIACEAE <i>Schinus terebinthifolius</i> Raddi. JEP 3643 (UB)	Murici – AL, 12/2001	Stem bark	Febrifuge; depurative; anti-rheumatic and anti-ulcer	Braga, 1953; Corrêa; Penna, 1984, Balbach, 1963; Balbach, 1966, Pereira et al., 2005
ANNONACEAE <i>Annona crassiflora</i> Mart JEP 3369 (UB)	Brasília – DF 08/1999	Leaves, stem bark and stem	Anti-diarrhoeal	Braga, 1953; Corrêa; Penna, 1984, Martins, 1989; Dos Santos; Sant'Ana, 2001
<i>Annona muricata</i> L. 8530 – IMA – AL	Maceió - AL. 08/2000	Leaves, stem and roots	Anti-parasitic; emetic; anti-rheumatic; astringent; anti-diarrhoeal	Braga, 1953; Corrêa; Penna, 1984; Gemtchújnicov, 1976
ARALIACEAE <i>Didymopanax morototoni</i> (Aubl.) Decne & Planchon.JEP 3634 (UB)	Murici – AL, 07/2000	Stem	Used to treat pain	Corrêa; Penna, 1984
ASTERACEAE <i>Senecio jurgenseii</i> Hemsl. JEP 3564 (UB)	Eldorado do Sul – RS, 9/1999	Leaves and flowers	In the treatment of malaria, fever and wound healing	Milliken, 1997
CELASTRACEAE <i>Austroplenckia populnea</i> (Reissek) Lundell. JEP 3747 (UB)	Planaltina - GO, 01/2001	Stem, roots bark and roots	Anti-tumour; anti-microbial	Corrêa; Penna, 1984
CLUSIACEAE <i>Rhedia brasiliensis</i> (Mart.)Planch & Triana. JEP 1793 (UB)	March. Deodoro – AL 08/1999	Stem	Tonic; anti-ulcer; used for wound healing and in the preparation of leather	Corrêa; Penna, 1984
FABACEAE <i>Erythrina mulungu</i> Mart ex. Benth JEP 3605 (UB)	S. J. da Tapera – AL, 08/2000	Stem	Tranquilizer; in the treatment of bronchitis, inflammations and (locally) lupus	Corrêa; Penna, 1984; Delorme; Miolla, 1979
<i>Pterodon polygalaeiflorus</i> Benth. JEP 3410 (UB)	Brasília – DF, 08/2000	Leaves, stem bark, root bark, root wood and seeds	Anti-rheumatic; in the treatment of throat infections	Corrêa; Penna, 1984; Nunan, 1985
LYTHRACEAE <i>Lafoensia pacari</i> A. St. Hil. JEP 3535 (UB)	Brasília – DF, 01/1999	Leaves, stem bark and stem	Febrifuge; anti-tumour; tonic; in the treatment of gastric ulcer and inflammations	Corrêa; Penna, 1984, Ali et al., 1995; Lima; Martins, 1996; Sartori; Martins 1996; Albuquerque et al., 1996
SAPINDACEAE <i>Cupania oblongiflora</i> Mart. JED 3538 (UB)	Matriz de Camaragibe – AL, 11/1999	Leaves and stem	In the treatment of coughs and whooping cough	Corrêa; Penna, 1984
<i>Serjania lethalis</i> A. St. Hil. JEP 3698 (UB)	Brasília - DF, 09/2002	Leaves and stem	Narcotic	Corrêa; Penna, 1984
SIMARUBACEAE <i>Simarouba amara</i> Aubl. JEP 3640 (UB)	Itabaiana – SE, 09/2001	Stem	Febrifuge; anti-diarrhoeal	Corrêa; Penna, 1984
STERCULIACEAE <i>Guazuma ulmifolia</i> var. <i>tomentosa</i> (Kunth) K. Schum. JEP 3644 (UB)	NS Socorro – SE, 09/2001	Stem bark	Astringent; depurative; in the treatment of syphilis and skin disease	Braga, 1953 Corrêa; Penna, 1984; Balbach, 1963; Balbach, 1966; Milliken, 1997; Vieira 1992
ZINGIBERACEAE <i>Costus spiralis</i> (Jacq.) Roscoe.  <i>Renealmia exaltata</i> L. F.	Maceió – AL, 03/2003 Brasília – DF, 07/1994	Leaves  Leaves	Anti-tumour; diuretic; anti-syphilitic; tranquilizer; in the treatment of renal stones Anthelmintic; tonic; in the treatment of stomach ache	Corrêa; Penna, 1984, Balbach, 1963; Balbach, 1966 Corrêa; Penna, 1984, Balbach, 1963; Balbach, 1966

## Female Empowerment

Amartya Sen has argued that empowering women as agents of development is a vital component of reducing child mortality rates and reducing gender bias in access to healthcare and education.<sup>34</sup> Land titling offers an ideal opportunity to place wealth, and therefore bargaining power, in the hands of Latin America's women, a condition which most visibly manifests itself in reduced fertility rates. Land reform contributes to reduced fertility rates through three main avenues: (1) conferring bargaining power to women, (2) shifting emphasis from quantity to quality of children, and (3) improved public health reduces child mortality rates, which in turn reduces precautionary births.

From a policy perspective, one of the most direct ways of altering the male-dominated, or *machismo*, power structure within the family is to confer economic power on the female. Land reform in both rural and urban settings accomplishes this cleanly and effectively. Marriage is a legal, emotional, and spiritual relationship, but it is also an economic relationship. Unlike other forms of conferred bargaining power, such as female earned and unearned income, land titling effects the woman's fall-back position rather than her contribution to the family. And unlike income, which can be fluidly transferred among family members, property rights are "pooled" among all family members making it impossible to deprive the woman of her economic rights. This type of power transfer changes the woman's fundamental position in the family's economic structure and is thus less susceptible to exogenous shocks ranging from international coffee prices to sudden illness in the family. But more importantly, because her economic rights cannot be taken from her, property rights increase her bargaining power within the marriage or permanent relationship by strengthening the power of divorce threat. If the woman goes, half of the farm goes with her. As the woman's bargaining power becomes more prominent in the

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<sup>34</sup> Sen, 195-198.

family, one of the most tangible ways we see that power manifest itself it through her input into child-bearing decisions in the form of reduce fertility rates.<sup>35</sup>

The second prominent way land reform reduces fertility is by encouraging parents to emphasize quality over quantity of children through property security. In impoverished rural areas where social services and financial infrastructure are rare, children sadly serve as cheap labor, earn wages, and ensure that parents will be cared for in old age. Because land titling increases household wealth through higher value of real estate or easier access to credit, demand for children, which typically act as a normal good, decreases with more secure property rights.<sup>36</sup> Finally, fertility rates, like most public health indicators have the benefit of exponential growth; as general public health improves, infant and child mortality rates go down and thus there is less need to have multiple children as a precaution to ensure some reach maturity. Therefore as the virtuous circle of development and poverty reduction is set in motion, improvements in overall health caused by land reform return to then further improve fertility rates.

Although in today's economic climate, female land titling is the most direct way to convey property rights and empowerment to poor women, there is historical evidence to suggest that agrarian reform itself has positive effects on female reproductive agency even absent of whose name is on the title. During the Chilean Agrarian Reform enacted in 1964 by President Allende's Christian Democrat administration, *campesino* society saw a 39% drop in fertility rates even though the Chilean model actively excluded women from property rights.<sup>37</sup> Even absent of female land titling, the Chilean example demonstrates how land reform itself can restructure gender roles and relationship to women's benefit, albeit through difficult and sometimes violent

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<sup>35</sup> Field, Erica. "Fertility Responses to Land Titling: The Roles of Ownership Security and Distribution of Household Assets." 2.

<sup>36</sup> Field, "Fertility Responses to Land Titling: The Roles of Ownership Security and Distribution of Household Assets," 4.

<sup>37</sup> Tinsmen 606.



social change rather than the rights more peacefully conferred by law. Tinsmen attributes this drop to two main determinants. First, land redistribution brought men closer to home, thus limiting their opportunities for extramarital sexual affairs while simultaneously increasing waged work for women by as much as 200 percent in certain regions.<sup>38</sup> Under these new conditions, women felt empowered to make demands on their husbands' time, money, and behavior in a paradigm Tinsmen calls "general mutualism."

The land reform also reduced fertility rates by coupling the reform with a massive expansion in rural medical infrastructure, which emphasized reproductive health and family planning. Clinics urged campesino men to redefine conceptions of male virility as the number of children father, and campesina women became more knowledgeable about and respectful of their reproductive agency.<sup>39</sup> Tinsmen claims that "[family planning programs] defined limiting family size and joint decision-making by husbands and wives as 'modern' behavior and equated modernity with what was desirable and respectable."<sup>40</sup> The effect of gender mutualism and enhanced public health education is evidenced by the reality that contraception use only rose 6 percent during this time period, meaning that the dramatic drop in fertility rates was due almost entirely due to women's ability to enroll their partners' cooperation in preventing pregnancy.<sup>41</sup>

Rural land reform has the added complication of juggling the necessity of honoring indigenous culture and land rights while encouraging specific economic and public health outcomes. As previously discussed, many indigenous cultures function within an economy of communal ownership, an ideal threatened by programs that require individual titles for defined land parcels. While de Soto adamantly argues that the economic benefits of land titling, both on

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<sup>38</sup> Thanks to the expansion in fruit and vegetable cultivation on small farms, the Acongacua Valley saw an increase in female agricultural workers from around 500 to over 2,000 workers from 1964-1975.

<sup>39</sup> Tinsmen 599.

<sup>40</sup> Tinsmen 601-602.

<sup>41</sup> Tinsmen 605.

an individual and national level, are most fully realized through clearly defined individual property rights, the impoverished indigenous communities are slow to accept what they view to be “Western” economic ideals of self-centered business practices and excessive accumulation. Communal economies, however, which often rely on oral legal agreements and familial claims to land, have been linked to increased fertility rates. For example, in the Mexican indigenous communal ownership unit, called an *ejido*, Vany and Sanchez observe that “since the land and other resources of the *ejido* are rationed by non-price means through a political body it is not hard to imagine that a large family is an asset,” and go on to assert that “a large family, with its allies, will find it less difficult to form a coalition that would block moves to reduce its land holding or use of *ejido* resources.”<sup>42</sup> In addition to the socio-political reasons for *ejido* members to want large families, more family members translate into more workers and more heirs to which land can be passed, which also allows families to accumulate larger and more fertile sections of the *ejido*.

### Migration Patterns

In the wake of Latin America’s conservative backlash during the 1950s-70s, the emphasis on industrialization and urbanization forced nearly a quarter of Latin America’s rural peasant population to migrate to urban areas in search of waged work and housing.<sup>43</sup> Today approximately 43% of Latin America’s urban population lives in these substandard sanitary conditions, with Peru alone shifting from 35 to 72% urban since 1940.<sup>44</sup> The extent of land

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<sup>42</sup> de Vany, Arthur, and Nicolas Sanchez. “Land Tenure Structures and Fertility in Mexico Land Tenure Structures and Fertility in Mexico.” (*The Review of Economics and Statistics*, Vol. 61:1, 1979), 3.

<sup>43</sup> Veltmeyer, 291.

<sup>44</sup> Vogl 301-303.

redistribution has been shown to reduce rural outmigration by increasing economic opportunity in agricultural areas, thus mitigating the need to seek waged work elsewhere.

Migration has a unique effect of agrarian land reform in that it improves the health of both rural and urban populations. The mass exodus out of the countryside directly contributes to overcrowding in urban slums, and this overcrowding places an incredible strain on the cities' already over-taxed public service systems. The detrimental effects of poor sanitation, inadequate waste disposal, and unclean water systems has already been discussed.<sup>45</sup> Additionally, overcrowding in urban slums has been linked to increased incidence of injury.<sup>46</sup> In addition to overcrowding in urban areas, temporary migration has been linked with increased HIV and other STD transmission, a problem that harms both the migrant workers and the rural lovers they infect upon their return. Migrant women are particularly vulnerable to rape and infection.<sup>47</sup> Finally, educated family members, regardless of sex, are more likely to migrate to urban areas, contributing to the rural "brain drain" phenomena.<sup>48</sup> The positive effects of education on health have been well documented, and thus retaining educated individuals in rural areas increases the likelihood of improved community health.<sup>49</sup> Therefore, measures to encourage a more evenly distributed population simultaneously encourage healthy family and community structures in rural areas while alleviating disease-causing strains on urban social and public infrastructure.

## **Part II: Contemporary Land Reform Models**

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<sup>45</sup> See "Housing and Infrastructure" above.

<sup>46</sup> See Reading et al., 1999; O'Campo et al., 2000; Delgado et al., 2002.

<sup>47</sup> See Bronfman *et al*, 2002

<sup>48</sup> Bravo-Ureta, Boris, Ricardo Quiroga, and Jorge Brea. "Migration Decisions, Agrarian Structure, and Gender: The Case of Ecuador." *The Journal of Developing Areas*. (Vol 30:4, 1996), 747.

<sup>49</sup> The positive effect of education on health is well documented. For example, studies in Uttar Pradesh, India demonstrate the effect education on fertility, infant mortality, and maternal mortality rates. Educated females enjoy an improved overall state of health, wait until later in life to have children, are more aware of neo- and postnatal care, and are more capable of providing for offspring's nutritional needs during early development (Ghosh,

This section examines three models for land reform – urban land titling, agrarian land redistribution, and a grassroots, NGO-led model. I will examine their ability to positively affect the above mentioned public health determinants and discuss observed health responses where appropriate and where data is available. For the urban and rural reform models, I examine Peru’s recently implemented COFOPRI and PETT programs, respectively. The case study for the NGO model is the land bank founded by the Nicaraguan public health NGO, Acción Médica Cristiana (Christian Medical Action).

### Urban Land Titling: The Lima Model

In 1996 the Peruvian government launched the largest and most comprehensive urban land-titling program in Latin American history. Over the next eight years, the Commission for the Formalization of Informal Property (COFOPRI) distributed between 1.6 and 1.4 million land titles for expropriated public and private lands currently occupied by squatter settlements. The COFOPRI program covered eight urban centers and ultimately formalized somewhere between 30,000 and 50,000 plots of land. In each community COFOPRI entered, they first mapped the community, drew preliminary property lines, and investigated disputes over informal property ownership. In an effort to prevent migration to communities first reached by the titling program, all recipient households were required to prove that at least one family member had lived on that land for at least 3 years. As a second criterion, all titles were distributed for state-owned lands or private property voluntarily sold to the state.<sup>50</sup>

The most pronounced effect of Peru’s land titling program has been an increase in the number of family members finding waged work outside the home. Work by Field finds that eliminating the need for adult family members to keep guard over their informal property claims

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<sup>50</sup> Vogl 2004, 302-306.

has resulted in a 17% increase in total household waged work hours and a 47% decrease in the probability of working inside the home. This translates into higher incomes and more potential resources for housing and medical expenditures. Additionally, because adult family members are no longer tied to the home, children are being used less frequently as wage earners as evidenced by a 28% reduction in the probability of child labor. This means that children are free to attend school, in which they are exposed to good nutrition through national school lunch programs and health education.<sup>51</sup>

Increased investment in home and community infrastructure is strongly pronounced in the Lima program. Over a four-year period, home investment in small renovations, as opposed to home additions, increased by 68%, and approximately two-thirds of this increase came from out of pocket expenditures. Field found that the amount of investment was equal regardless of whether the family had received some form of formal credit, implying that households are choosing to defer currently held resources towards home improvements.<sup>52</sup> This imbalance is likely caused by the insufficient supply of credit to meet expanding demand in titled communities. Field found that while demand for credit nearly doubled on average, that demand was met with only a 49 percent increase in loans granted.<sup>53</sup>

In terms of nutrition, Lima yielded the same mixed results as numerous other urban titling programs. Overall, childhood nutrition indicators in weight-for-height improved, while long-term indicators in height-for-age remained constant. Furthermore, the increases in child weight are accompanied by increases in both childhood and overall obesity rates, leading researchers to question whether increases in weight necessarily correlate with improved nutrition. They cite

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<sup>51</sup> Field, Erica. "Entitled to Work: Urban Property Rights and Labor Supply in Peru." (*Quarterly Journal of Economics*: MIT Press, 2003), 31-40.

<sup>52</sup>Field, Erica. "Property Rights and Investment in Urban Slums," (*Journal of the European Economic Association*. 2005) 4.

<sup>53</sup> Field, "Property Rights and Investment in Urban Slums," 19.

that because urban families more commonly suffer from malnutrition than undernutrition, increases in income do not necessarily translate into improved food choices. These findings in nutrition, combined with the increase in out of pocket expenditure in home improvement, lend support to fears that the emphasis of land titling on developing physical capital would cause human capital in health and education to be short changed in the short run.<sup>54</sup>

There is currently no data on the effect of this program on migration patterns. Again, in an effort to prevent selective migration and consequent overcrowding, a major criterion for receiving a title is proof that at least one family member has lived on the parcel of land to be titled for at least three years. But there is no evidence concerning the efficacy of this stipulation or the program's effect on national migration patterns.

#### Agrarian Reform: Peru's PETT Program

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The majority of contemporary scholarship on Latin American land distribution discusses the urban land titling programs that swept South America in the late 1990s. Combining these studies with lessons from historical agrarian reforms, there is evidence to suggest that that many of the benefits for public health we have seen in the slums of Lima, Buenos Aires, and Rio de Jenero could be applicable to the rural agricultural communities with the addition of additional rural dynamics of agriculture. Peru is one of the few countries to match urban titling with an agrarian counterpart program. In 1991, the Peruvian government implemented the Special Rural Cadastre and Land Titling Project (PETT). After six years of moderate success in the coastal regions, the Peruvian government teamed up with the Inter American Development Bank in 1996 to increase coverage to all of the country's rural areas. As of 2000, the PETT had surveyed 1.9

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<sup>54</sup> Vogl, 2004. 316-319.

million parcels of land and registered 900,000 new titles comprising 51% of the rural costal land parcels.<sup>55</sup>

Although data on the results, especially on any public health responses, from the reform is sparse, it seems that the primary benefits of the program have been increase in property value, and consequently household net worth, and increased home investment. In 2000, surveys found that the registered and titled properties were valued 179 percent higher than untitled lands. Torero and Field also found that titled lands saw an increased investment in homes (measured by improvements made to fences). Because this change in expenditure was more pronounced among households that held titles the longest, Torero and Field emphasize that land reform may not provide instant gratification and that, like many development measures, the full effect of reforms today may not be seen for many years.<sup>56</sup>

This increased value can be partially attributed to a vast crop diversification, shifting from predominantly potatoes, beans, and corn to a wider variety of fruits and vegetables such as grapevines and asparagus. It is unclear what, if any, effect this crop diversification has made on either income from commercial sales or on family nutrition, but Field found that land titling, with the enforced stipulation that agricultural lands be cultivated using natural fertilizers saw an reduction of 55.5 kg of chemical fertilizers annually per household and a simultaneous increase of 47.1 kg of natural fertilizer.<sup>57</sup> Natural fertilizers both solve the food poisoning problem while also reducing household expenditures on farm supplies. This allows for the diversion of resources towards other activities, such as education or medical care. It essentially allows families to “go organic,” not because it’s trendy, but because it is the healthiest, most cost-effective and financially secure means of providing income and nutritious food for their families.

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<sup>55</sup> Torero and Field, i-ii.

<sup>56</sup> Torero and Field, 12.

<sup>57</sup> Field 23.

## Land Banks: A Nicaraguan Grassroots Model

Land banks attempt to connect a community by improving the agricultural opportunities and economic returns for a small, specific geographic location. Often following the cooperative market model, these “banks” work a sort of rural microfinancing program and mandate that community members work together to create a local economy. Acción Médica Cristiana (Christian Medical Action) is a Nicaraguan public health NGO that places a large volume of its financial and human resources towards land banks and medicinal farms in Nicaragua’s indigenous regions. Through a land bank, AMC simultaneously tackles the three greatest obstacles to public health their NGO has encountered while working with Nicaragua’s impoverish and marginalized indigenous communities: increased financial security and a sustainable, nutritious food source. With aid dollars from private donors, Church World Service, and Food Resource Bank, AMC purchased a 150-acre plot of land in Aguas Amarillas in the province of Matagalpa and distributed the land among fifteen families. AMC officials took great care in choosing land with no existing titling battles. Because the Sandinistas promised the titles of former Somoza loyalists to various FSLN supports, today the ownership of large tracts of Nicaraguan land is still highly contested, making it difficult for politically impotent peasant farmers to hold any claims to land.

The participating families received 15 acres plots of land, for which they will pay back \$150 without interest for ten years. These returns will then go to establishing another land bank in a new community. Titles are required to include both the male and female heads of household. Along with paying their installments, community members (as the recipient families are called) are instructed in and promise to use sustainable agricultural techniques. Fertilizers



are produced through vermiculture. Agroforestry lends itself to crop variety and prevents long-term erosion of soils. Each community has a scholarship fund to send a limited number of community members, especially females, to university for degrees in agronomy, nursing, or seminary. Families are provided with instruction on general public health and sanitation concepts, nutrition courses, and medicinal gardening, for which they promise to set aside a small plot of their land.<sup>58</sup>

Although there is not yet any available data examining the outcomes of this program, no national plan has yet encompassed all of these health-benefiting characteristics as well and completely as grassroots NGO models. The combination of property rights, sustainable farming techniques, female empowerment, and public health-education intrinsic to this model demonstrates the flexibility locally run organizations enjoy in addressing specific targets and the unique needs of their situation.

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### **Conclusions**

Poor public health is symptomatic of structural violence within a society. As such we cannot attack it through vaccinations and dental hygiene education programs alone. Public health workers now understand that to attack to root cause of poor health in the developing world, we must incorporate economic, political, and social reforms into our plans. Land reform is one sweeping national policy that can accomplish many of these areas in one program. The results of this paper are certainly not conclusive in empirically illustrating causal relationships between land reform and improved health, and I do not claim that agrarian reform is a panacea for poverty and poor health. But the linkages discussed above highlight the need for more work

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<sup>58</sup> Petersen, Julie. "Nicaragua Journal," 2007.

by more experienced economists, political scientists, and health workers to be undertaken and to more clearly define this relationship and the potential benefits it offers.

A comparison of the three reform models – urban, rural, and grassroots – illustrates the age-old tradeoff between sweeping national programs that reach millions of deprived citizens versus small-scale local initiatives tailored to local needs. National programming reaches the largest number of deprived citizens and has the widest resource base to enact large-scale social and economic change. However, of the three case study models no program is more effective at achieving a wide breadth of positive public health outcomes than the land bank. Community centered programming allows organizers to attack avenues of deprivation specific to their surroundings. My primary policy recommendation calls for a decentralized national programming. The state is the most practical vehicle for acquiring, either through economic or political coercion, the massive tracts of land needed for redistribution. Federal legislation must mandate that both male and female heads-of-household must be names on the title. It must then become the responsibility of local leadership to oversee the necessary programs to instill sustainable agricultural techniques and responsible allocation of resources within the home to improve child health, reduce fertility rates, reverse outmigration, and reduce poverty.

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